

APPENDIX C5

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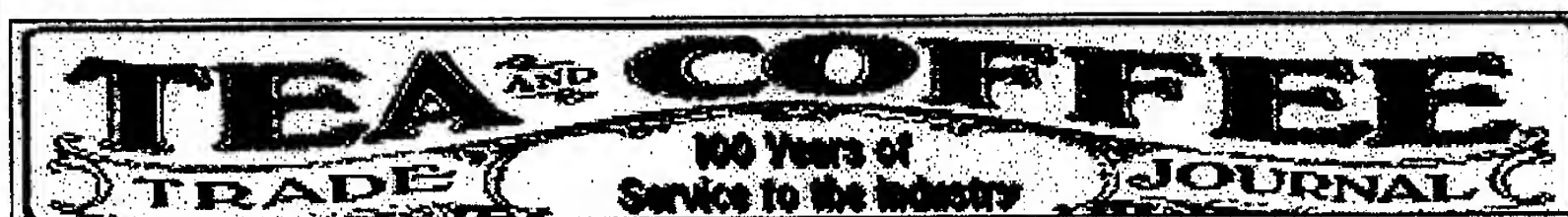
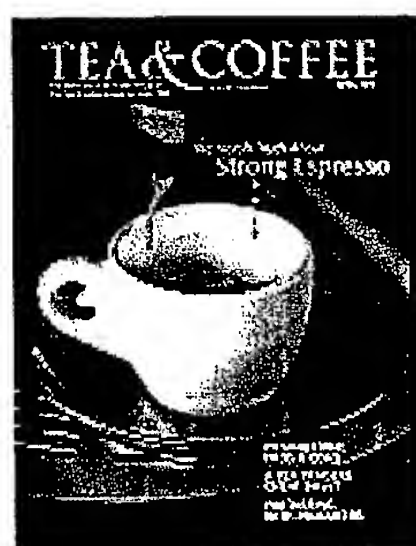


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Coffee: Then and Now...

BY TIMOTHY J.
CASTLE

There are several challenges in surveying the advances of the coffee industry over the past 100 years.

First, one person's advance is often another person's setback. Further, some people may be satisfied to think that the industry advances by incremental steps; others look for progress on a more global scale - some indication that the market or its supply is shifting in tectonic ways as opposed to its landscape altering in color or texture. Finally, some are puzzled by the talk of "progress" to begin with, asking why such a basic, simple and delightful thing as a cup of coffee needs to advance beyond what it already is - if anything, this last group argues that coffee needs to shift back to its more basic origins.

It may be, in fact, that the best an observer can hope to do is to characterize the terms of and nature of the debate regarding "the progress of coffee" rather than attempting to define what has, in fact, constituted progress over a given period of time. Most of this, of course, has to do with our perspectives - our background, training and, perhaps most powerfully, our economic interests which, even for those with the most finely tuned moral compasses, is a hard thing factor out.

One thing upon which almost everyone in the coffee industry will agree is the astounding lack of progress in the basic knowledge of our product. From hybrids to drying and milling, from roasting and even the seemingly basic act of grinding, few hard facts are known. The average home brewer of beer, as one of our interviewees pointed out, knows more about his beverage of choice than many "industry experts" know about coffee.

Given the possible perspectives from which our topic might be viewed, it might be assumed that an objective opinion might be impossible to find but such is not the case. It is Ted Lingle's job, as executive director of the Specialty Coffee Association of America (SCAA), to form such an opinion. By all accounts, and especially this one, he has been consistently successful, although some may not agree with him. Lingle first pointed out some general fields of possible progress, "There are really nine areas I can think of that have been crucial to the progress of the coffee industry over the past century." Lingle began, "The technology of roasting with convection heat versus conductance; the introduction of the vacuum tin during the first part of the twentieth century and the valve bag during the last; the scientific analysis of brewing, primarily by Doctor E. E. Lockhart in the 1950's; the increasing use of coffee hybrids; the

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development and evolution of espresso; the increasing popularity of the paper filter; and finally, advances in the technology of decaffeination and soluble coffee manufacture." In covering these topics Lingle pointed out that in some areas progress had been limited or of mixed results.

"The biggest development in roasting," Lingle noted, "is the shift away from roasters that heat the coffee primarily by conductance to those that work by heating the coffee chiefly through hot air convection." As for other roasting advances, Lingle was less enthusiastic, doubting whether the actual process of roasting, to which increasingly sophisticated technology is being applied, is understood fully enough to justify the particular technology's application.



The vacuum tin, according to Lingle, was a mixed blessing, "It's ironic that one of the best systems for packaging coffee has come to symbolize low quality coffee and is responsible for the massive consolidation of the industry." The symbolism that Lingle is pointing to is powerful. Many specialty roasters are now reluctant to use a newly developed "valve can" not because it doesn't work - it is potentially one of the best storage systems to date - rather, many specialty roasters are reluctant to use any can in their packaging because they are afraid that customers will associate their coffee with regular "canned" coffee.



The valve bag is one of the most used and misused packaging systems extant in the market today. Just as the tin tie has come to symbolize mediocre, lower quality coffee, the valve bag has become symbolic of quality and freshness - many consumers believe that whatever is in the valve bag is better than what might come in any other packaging. Lingle noted, "The valve bag is not a perfect system and all films are permeable to a certain extent. Oxygen can get in. Nonetheless, valve bags have allowed for the wider distribution of specialty coffee and for a second wave of consolidation, although to a lesser extent than the consolidation that followed the introduction of the can."



"The scientific analysis of brewing," Lingle continued, "was one of the most important advances of the past century. Up until the time this research began, and it was primarily conducted by Doctor E.E. Lockhart in the 1950's and early 1960's, any discussion of brewing couldn't be anything but subjective. What the research gave us was an understanding of what does happen and what should happen. Unfortunately, much of Doctor Lockhart's research got locked away when he was later hired by a private company."

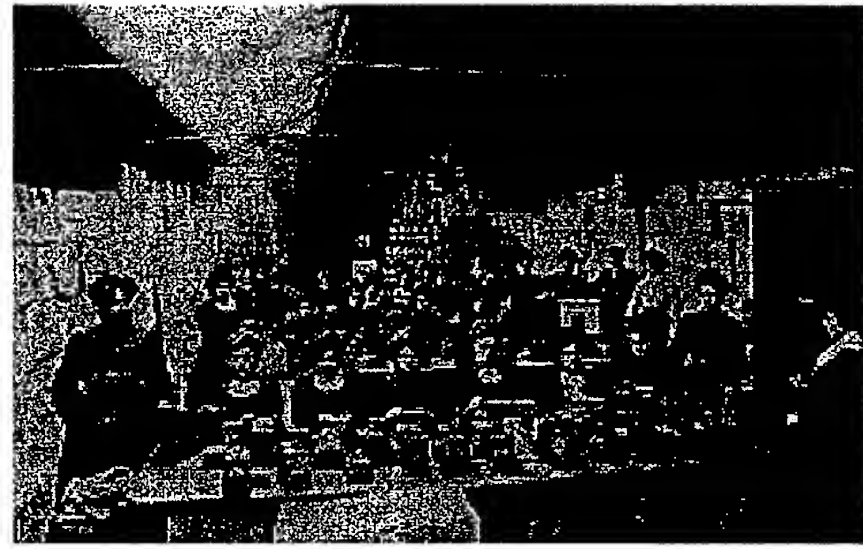
"I am convinced," Lingle began regarding coffee hybrids, "that the best hybrids for coffee production have yet to be discovered. While the industry has done a great job developing plants from the trees generally in use, those trees come from a very narrow gene pool and the bulk of what's possible is still out there in the highlands of Ethiopia and Yemen. Genetic engineering is another possible area of progress and there is a French project in French Guyana that is already underway. Another in Hawaii is still at the laboratory stage, but this has more implications for the future than it does for today."



Espresso, as we know it, did not exist one hundred years ago and its evolution and development have changed the industry radically. While certain businesses with a food service emphasis have flourished, the coffee industry itself has not benefited as much as it might have. Consumers were evidently interested in a better cup of coffee - they think they've found it in a 20 ounce paper cup full of milk. Although espresso in some form existed earlier, the true espresso machine did not appear until the twentieth century. This constituted a whole new way of brewing coffee and a new way of looking at our product.



Decaffeination technology was born in the 20th century, and steadily improved since its first application. Lingle noted that the decaf category provides an example of how the coffee market can change dramatically in a relatively short period of time. "It used to be that when you ordered decaf in a restaurant you were almost invariably served decaf. Now you can't even find it on the grocery store shelf, much less in a restaurant."



"When it comes to soluble technology," according to Lingle, "our industry has not paid enough attention. All we know is what we've seen, but technically it could be possible to produce a good cup of coffee from an instant."



But Lingle reserved his assessment of the most important technological advance of the past one hundred years for one of the simplest and yet most profound innovations of the coffee industry: the cheaply produced and very inexpensive paper filter. "The paper filter developed by Bunn in the 1960's led to the fairly rapid elimination of the percolator," says Lingle. Lingle asserted that the paper filter, first used in foodservice and then shortly thereafter adopted for home use gave consumers a simpler and better way to brew coffee.

When asked why there has not been more progress in the coffee industry during the age that took us from horse drawn carriages to the space shuttle, Lingle quipped that industry members need to be more open to new ideas and keep a more open mind about how they do things.



Lingle, in concluding, wanted to remind everyone that, "...advances in technology do not mean advances in quality. You don't have to look back over the last one hundred years but simply over the last thirty. Yet the moral of all this should be that can't stand still as an industry - just ask Sanka."



Roland Veit of Paragon Coffee Trading Company, L.L.C., brought the newly acquired perspective of a coffee farmer to the assessment of the last one hundred years, "As someone who now operates a farm in Brazil, I have to say that the mechanical harvester has had tremendous impact on the industry. Obviously, not everyone can use them, but those that can obviously produce coffee much less expensively. Other than that, I would have to say that the espresso machine, as a brewing device, represents a major change in the industry. In many countries they don't even refer to it as an espresso machine, but simply as a coffee machine. I see this trend continuing." Indeed, a less expensive raw material combined with a brewing system much sought after by the world's growing middle class may lead to even bigger changes in consumption patterns that have only just started.

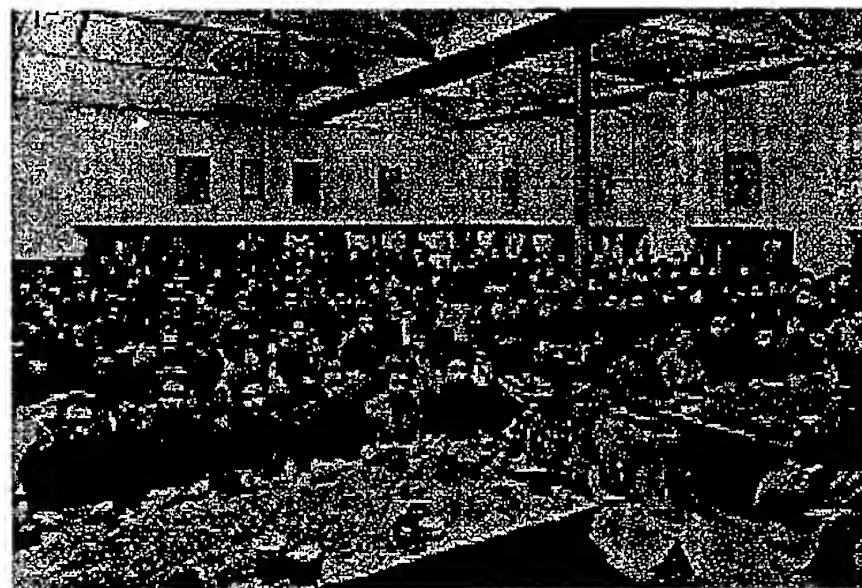
Kevin Knox, green coffee buyer for Allegro Coffee Company felt reluctant to identify technological breakthroughs, but did mention one advance not yet covered here, the introduction of the "French Press" or "Melior" coffee maker. This coffee maker is the brewing method of choice by many in the specialty trade and has become a sort of talisman of product integrity and quality on the West Coast. Knox also broke the advancements in espresso into two discreet accomplishments, "the invention of the first pump driven espresso machine and the introduction of the first mass marketed espresso machines." While not everyone believes that the proliferation of espresso based beverages has been good for specialty coffee, there is near unanimity that espresso changed the



path of the specialty coffee business to a very great extent.

Don Holly, at the time of his interview for this article was preparing to leave his position as administrative director of the SCAA for a post involving quality control and research for a publicly owned wholesale and retail roaster on the East Coast. When asked what advances had meant the most over the past one hundred years, Holly made the challenge, rather, to look forward, "There's much more that needs to be accomplished in the next ten, it is amazing to me how little we know about our product. We are dealing with the greatest agricultural product in terms of value traded across international borders, after all. We stifle ourselves into mediocrity - perhaps for two reasons; first, anytime you approach a place you don't understand you get uncomfortable, so you back up to where you are comfortable and to what you know; second, when you strive for an ideal your success rate is much more volatile, you can sometimes hit but often you're wide of the mark. If you shoot for the mediocre you can more consistently hit and hit closer."

Holly then compared the coffee industry with the beer and wine industries. "Beer and wine are less complex on a chemistry basis in terms of the process. Fermentation is a lot simpler than roasting - the controls are simpler. If you pick up a [beer] brewing magazine it will tell you what the acid levels are of twenty-eight different kinds of hops. What coffee periodical regularly deals with issues as complex? Compare the number of 'Dummies' and 'Idiots' guides to wine and beer with the number of books about roasting for the beginner. Other than Kenneth Davids' book about home roasting, there really isn't anything. ...One of the more valuable texts I have is on the Maillard reactions during roasting, but there needs to be more on this incredibly complex subject. The fact is, half of the roasters out there are roasting opposite the other half and neither knows who's right, they've both just come to believe that their doing it the best way because they like what they produce."



In terms of categorizing the progress that had been made, Holly brought up several broad categories, "The first category of change is brewing, with espresso being the most technologically advanced method and obviously tremendous impact. Drip brewers, as well have changed and evolved, but let's try to produce an ideal beverage the development of broader spray



heads and pulsing technology will help us get closer to what will consistently produce a great cup of coffee. Many manufacturers are working toward this goal today."

Holly allowed that some of the technical advancements in roasting, particularly with regard to the measurement and control of the process were changing the way coffee is roasted and usually for the better. But he was skeptical of many of the more complex systems now being installed. "Often the people buying these systems don't know how to operate them or what they're really supposed to do," he stated. One could infer from his remarks that a roaster would be wise not to buy a roasting system that is smarter than the people who will be operating and managing it. Clearly, as this dynamic and important industry matures, the manufacturers who can apply technology to specific challenges in roasting, and document the advantages of their systems, will have a definite advantage.

Holly, like Lingle, agreed that work of Dr. E.E. Lockhart was some of the most important to have been conducted during the past one hundred years. He concluded, however, with another example of the coffee industry's seeming reluctance to document the basic technology of each of its core processes. Referring to his new challenges in the for-profit side of the coffee business, Holly concluded, "One of the first projects I'm going to work on is grinding, the last best study was done in the 1940's and was compiled and analyzed by the U.S. Dept of Commerce. Submissions from the trade supplied the raw data, yet you look at it and you realize that it is absolutely irrelevant for what we need today."



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Coffee: Then and Now... (continued)

It may surprise readers who do not know Don Holly - given some of his comments here - that he is one of the most optimistic and indefatigable boosters of the coffee industry that anyone could ask for. He is also, however, someone who also does not flinch from the facts, as he sees them. This gets back to the earlier comments of Ted Lingle, and his reference to the greatest impediment to progress that the coffee industry has yet faced, that being the lack, many times, even among the best of us, of an "open mind." Perhaps over the next one hundred years, this magazine will report on the systematic disassembly of that barrier, and the greater prosperity through a better cup of coffee that was the result.

As part of the background for this article, several industry participants were asked to contribute their sentiments on the last century of progress in the coffee industry. Three people responded and their comments follow:

Gordon McNeil of Equip for Coffee provided several positive insights into the progress of the coffee industry. "I have had the opportunity to observe most of the wholesale, retail, and equipment segments of the industry for the last 16 years being closely involved with Probat, Mahlkonig and Grindmaster as well as manufacturing our own brass, copper and/or stainless whole bean dispensing display bins and other products.

"The two biggest driving forces have been price and quality. All other developments, good and bad, have been outgrowths of these big factors.

"The lower quality of the large U.S. roasters caused the specialty coffee industry to be created and thrive. If the overall quality had been kept higher, there would not have been as much of a driving force to have specialty coffee. However, we have seen where a large number of people can clearly taste the difference, a market formed that has grown into a significant segment of the industry today.

While McNeil credited equipment advances for improving coffee quality, he noted the limits inherent in this. "However," McNeil stipulated, "great equipment cannot make good coffee in the cup out of poor quality green beans."

McNeil then addressed the subject of roasting, "In the roasting area there are some common techniques in use that work well for any coffee. Today, most roasters use mostly convection heat, instead of conduction and radiant heat which was all there was one hundred years ago, to roast the coffee."

McNeil brought up the issue of grinding and found some things to cheer. "In the grinder end of the business, equipment people have developed faster and cooler operating grinders to improve the quality of the ground coffee. Also the development of portion control foodservice and espresso grinders allow



foodservice and coffee shops to brew freshly ground coffee to improve taste."

In addressing the more widespread use of thermal carafes, McNeil also rang a positive note, and an advance that many of us now take for granted. "The brewer manufacturers all offer thermal airpot carafes to keep the brewed coffee hot without degrading its flavor on a hotplate. This has been one of the recent good advances in the industry. Combining the freshly ground coffee and airpots have resulted in much better cups of coffee being available."



When it came to coffee packaging over the last 100 years McNeil, unlike some of his colleagues, seemed to believe that there was no development that should not be applauded, "The packaging has been greatly improved to keep the coffee fresher until brewed. First it was the vacuum cans, then came brick packs, nitrogen flush and one way valve bags to preserve flavor."

McNeil concluded by drawing upon the dialectic he earlier defined, "Price and quality have helped make happen many of these positive improvements, but price has also caused negative developments. [I] already commented on the effect poor quality in U.S. giving opportunity for the specialty coffee industry, but at the same time causing



greatly reduced consumption of coffee. We have seen green prices jump way up from frosts in Brazil and plunge way down due to the present oversupply of coffee. Unless the farmers can see a profitable reason to grow coffee they will drop out of the business. Therefore, smart coffee roasters and their customers will need to pay a premium to insure the supply of specialty beans that are truly special. Without the roasters, and their customers, paying a premium it is likely that many specialty beans will disappear from the market. For the long term the industry must support the farmers."



Finally, McNeil mentioned a crucial resource upon which all progress in the industry is based, the quality of its members, "Fortunately, the quality of the people in the industry can make this possible. The passion of the people in the industry for coffee is such a contrast to other industries where I have worked. This passion gives me hope that for the next one hundred years that the industry will continue to flourish."



Bill Sieber, director coffee & tea flavor division of Melchers Flavors of America, Inc. had this to say about his company's role in the coffee industry's progress over the last 100 years, "Melchers pioneered the development and introduction of flavors for gourmet coffees to the American consumer in the early nineteen-eighties. The growth of this new industry segment has been phenomenal for the past two decades. Flavored coffees created an awareness of gourmet coffees which continues to grow to this day. Innovative allied products such as cappuccinos, cold and frozen coffee beverages have begun to enhance the continued sales of coffee throughout the North American market place. The same awareness is growing in the Asian and South American market places. Melchers has experienced growth in smaller areas such as Europe, Africa and Australia." Indeed, while many purists resist giving the category its due, flavored coffees popularized the whole bean sector and may have created, over the past two decades, many more specialty coffee drinkers than otherwise would have appeared.

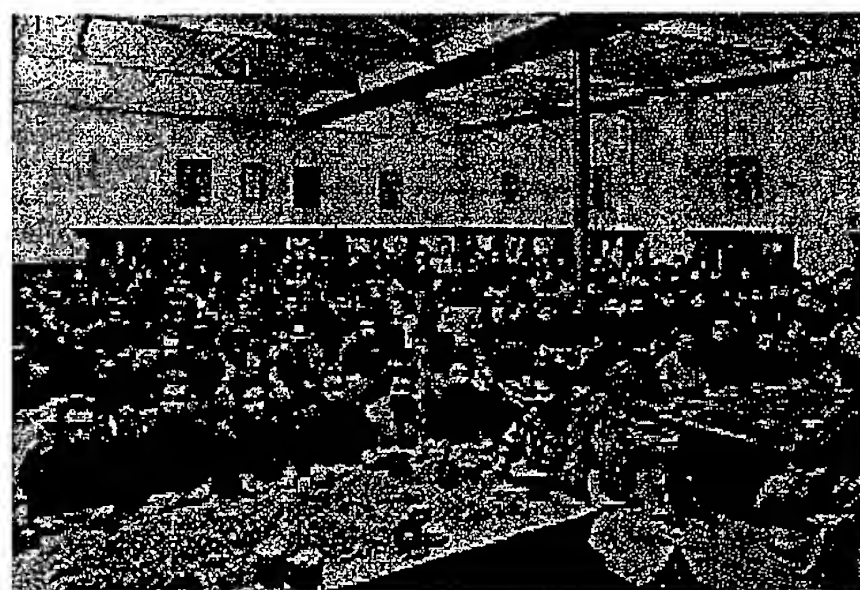
Sieber concluded his comments by addressing the basic flavors his industry



relies on and their crucial dependence upon coffee for their continued popularity. "Flavored coffees have become a main part of the gourmet coffee industry sales revenues. Melchers looks to offer improvements in the classic taste profiles of hazelnut, French vanilla and chocolate flavors in order to insure the continued success of the gourmet coffee roasters they partner with." Coffee flavorings, as opposed to flavored syrups, depend on the success of coffee overall. Syrups are not nearly so dependent.

Maurizio Giuli, marketing representative for Nuova Simonelli of Belforte del Chienti, Italy, had this to say regarding the most influential development over the last 100 years. "The business of espresso coffee machines is younger than Tea & Coffee Trade Journal, since the first examples of this kind of equipment started in approximately 1905 with Victoria Arduino and Bezzera." Giuli then described the success the first espresso machine manufacturers had in selling machines across Europe. He also offered a little history of the espresso bar, "In Italy, before the introduction of espresso machines, the "osteria" and the "cantine," were popular. Here people went to drink some wine and discuss things. The cafés, on the other hand, were reserved just for high social levels. With the introduction of the espresso machines, the habits of Italians changed and the old local establishments started to sell coffee besides wine and other spirits. This started the era of the "bar" where people went for discussion and a cup of coffee besides." Giuli then pointed out that the progress of the Italian espresso bar became interlinked with another form of technological progress. "But it was just after World War II that the bars had a big boost." As Giuli explained it, most villages and small cities could only support one bar, so it was not surprising that not many people in these small towns could afford the first televisions. The proprietors of the bars bought the TVs and their patrons flocked in even greater numbers to now drink espresso and watch TV. "When the television wasn't so widespread among families, the bars were a place where people went to watch their preferred program."

Giuli then credited the spread of espresso worldwide with the emigration of Italians across the globe. He claims that espresso spread in much the same way that Italian food did. "Italians émigrés... gave a push to the widespread popularity of Italian food world wide [like pasta, pizza, wine etc.] and of course even the espresso coffee and cappuccino. Now we can say that this business is a global business and that the last century has been the first century of the espresso coffee."



Giuli credits technological advancement for espresso's steady rise in popularity. "The introduction of new technologies to the espresso machine has been one of the main factors that allowed the development of this industry. In fact, in the first years, the machines were so big and so complicated that few people were able to utilize them properly; in some case these

machines were also very dangerous, because of the pressure inside the boiler. The introduction of a separate system of pressure [lever and pump - an introduction of "Simonelli"] and the improvements of the group heads, allowed for improvements in the quality of espresso beverages. During the 1980's the introduction of electronic technology allowed us to have machines that were very easy to use, and where there was no longer required a long training period for successful operation."



In reciting the history of espresso, however, Giuli can't resist giving his company, Nuova Simonelli, some credit where he feels it is obviously due. "Nuova Simonelli has been one of the most technologically oriented manufacturers since it was founded in 1936. Mr. Simonelli was the first to introduce a pressure system based on a pump. Now more than ninety-five percent of the espresso machines produced use a pump in order to increase the pressure of water to nine bar." Giuli also claimed that Simonelli was one of the first to introduce computerized espresso machines which could, among other functions, tabulate the number of drinks served.



Giuli then predicted that the increasing technification of the espresso machine business will continue. He thereby implied that coffeehouses, per se, could suffer because any business could operate a fully automatic and self-maintaining machine. "The new generation of espresso machines will be connected by Internet and will be processing lots of data worldwide, this will allow for remote maintenance. Probably they will also be able to produce other new hot beverages besides espresso and cappuccino. If we consider that just one hundred years ago it was not possible to drink an espresso or a cappuccino, it is clear how difficult it is to understand what will happen in the next one hundred years. Surely we will be able to continue to drink good cups of espresso and cappuccino thanks to these new espresso machines."



Assessing progressing, in the final analysis, gets to be a very subjective game. It seems that the best, most rewarding advancements are those made with the understanding that as an industry we depend on the popularity of a very singular thing, the taste of a rather peculiar beverage made in the most unlikely manner. Coffee is a drink that has hardly any redeeming characteristic other than that it sometimes tastes remarkably good. It is for that "sometime" experience that coffee drinkers will continue to search. Anything that aids in that search might usefully be called "progress."

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